European Annals of Otorhinolaryngology, Head and Neck diseases 132 (2015) 301–303

Available online at ScienceDirect www.sciencedirect.com

Elsevier Masson France EM|consulte www.em-consulte.com/en

Case report

Oncocytic parathyroid adenoma

A. Paul [a], A. Villepelet [a], M. Lefèvre [b], S. Périé [a,*]

[a] Service d'ORL et de chirurgie cervicofaciale, Hôpital Tenon, AP–HP, Université Pierre et Marie Curie, Paris VI, 4, rue de la Chine, 75020 Paris, France
[b] Service d'Anatomie pathologique, Hôpital Tenon, AP–HP, Université Pierre et Marie Curie, Paris VI, 4, rue de la Chine, 75020 Paris, France

ARTICLE INFO

Keywords:
Oncocytic parathyroid adenoma
Hurthle cells
Fine-needle aspiration
Hyperparathyroidism
Thyroid follicular neoplasm

ABSTRACT

Introduction: Fine-needle aspiration cytology (FNAC) of thyroid nodules commonly reveals the presence of oncocytic cells (or Hurthle cells) in a follicular neoplasm. Histological examination is necessary to determine the benign or malignant nature of the tumour. However, oncocytic cells are also normally present in the parathyroid glands.
Case report: A thyroid nodule was discovered on thyroid ultrasound in a woman with a history of left partial thyroid lobectomy. Fine-needle aspiration cytology revealed a follicular neoplasm comprising oncocytic cells (Hürthle cells). This woman also presented features of hyperparathyroidism with hypercalcaemia. $^{123}I/^{99m}Tc$-sestamibi and ^{18}F-fluorocholine PET-CT scan revealed increased uptake over the remaining left thyroid lobe. Left lobectomy was completed together with thyroid exploration. Histological examination revealed a parathyroid adenoma in the residual thyroid tissue. Parathyroid hormone levels subsequently returned to normal.
Discussion: Cytomorphological similarities are often observed between parathyroid and Hürthle cell thyroid tumours. The parathyroid rather than thyroid nature of the tumour must be strongly suspected preoperatively in the presence of hyperparathyroidism.

1. Introduction

Preoperative assessment of a thyroid nodule classically comprises TSH assay and thyroid ultrasound [1]. Fine-needle aspiration cytology according to the Bethesda classification allows estimation of the risk of malignancy [2], which ranges between 15% and 30% in the presence of a cytological diagnosis of follicular neoplasm. The presence of oncocytic cells, also called Hürthle cells or oxyphil cells, within follicular neoplasms requires histological examination to confirm the benign or malignant nature according to the presence or absence of capsular invasion.

However, oncocytic cells are also present in normal parathyroid tissue. Oncocytic parathyroid adenomas, predominantly (more than 70%) or exclusively composed of oncocytic cells are rare (4.4 to 8.4%). This case report illustrates that a parathyroid adenoma arising in thyroid tissue can mimic a follicular neoplasm in the presence of Hürthle cells on cytology.

2. Case report

A 62-year-old woman with a history of left partial thyroid lobectomy (benign nodule) complicated by recurrent laryngeal nerve paralysis was referred with breathiness. Otorhinolaryngological examination revealed left vocal cord paralysis in an isolated paramedian position, with air leakage during phonatory efforts. A poorly mobile, painless, soft, left thyroid nodule was detected on palpation. Thyroid ultrasound revealed bilateral micronodules and a heterogeneous left lower pole nodule with a long axis of 16 mm, with central and peripheral blood supply (type 3). Fine-needle aspiration cytology of the thyroid nodule diagnosed a lesion suspicious of oncocytic (oxyphil, or Hürthle) cell follicular neoplasm. The laboratory work-up revealed normal thyroid hormones, low calcitonin, and hypercalcaemia at 2.85 mmol/L (ionized calcium: 1.45 mmol/L), with elevated parathyroid hormone level (1-84 PTH) at 198 pg/mL with no signs of vitamin D deficiency. No other abnormality was detected on the laboratory work-up.

This patient was referred for management of a possible malignant thyroid nodule and assessment of the risk related to completion of the thyroidectomy due to the presence of recurrent laryngeal nerve paralysis associated with hyperparathyroidism. $^{123}I/^{99m}Tc$-sestamibi (TcMIBI) scan and ^{18}F-fluorocholine (FCH-PET) (Fig. 1) revealed a single site of increased uptake over the remaining left thyroid lobe, suggestive of parathyroid adenoma arising within thyroid tissue due to the presence of a single ultrasound nodular image in the residual left lobe with $^{123}I/^{99m}Tc$-sestamibi and ^{18}F-fluorocholine uptake associated with Hürthle cells on cytology. The previous left partial thyroid lobectomy may also have modified the anatomical relations and the topography

* Corresponding author.
E-mail address: sophie.perie@aphp.fr (S. Périé).

http://dx.doi.org/10.1016/j.anorl.2015.08.033
1879-7296/

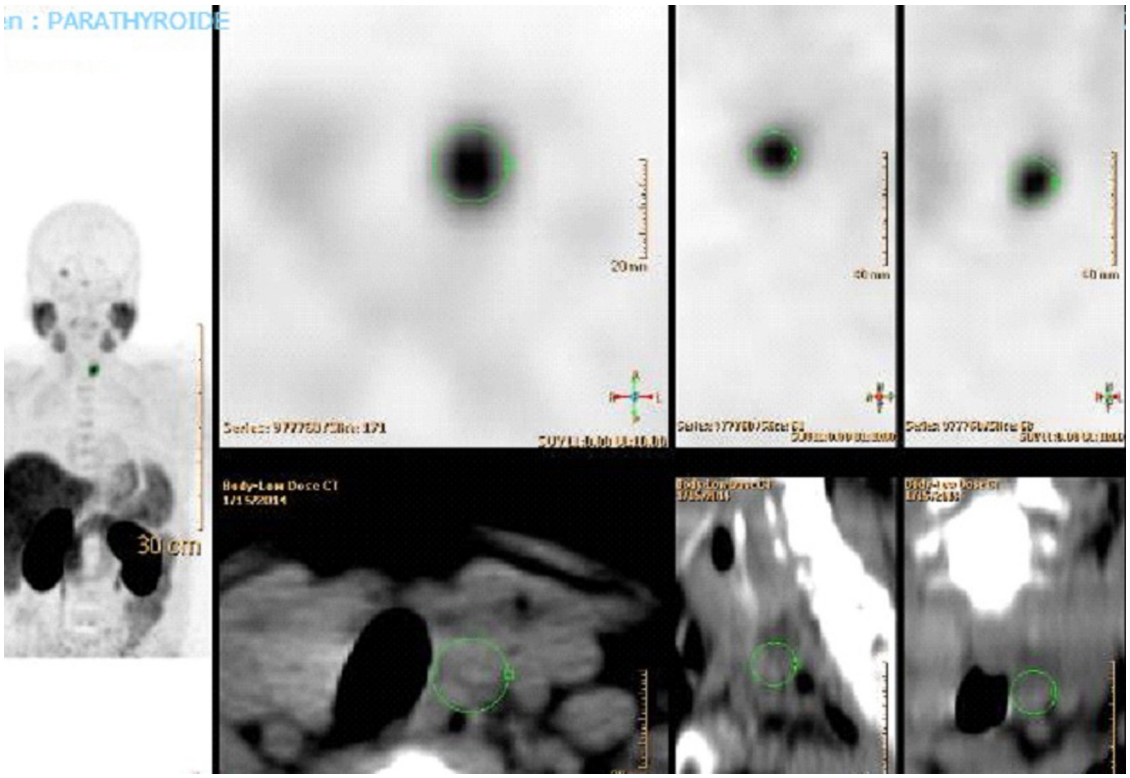

Fig. 1. ^{18}F-fluorocholine PET-CT scan. PET: uptake over the left thyroid lobe (left inset); PET: zoom of the zone of uptake in the neck (upper inset); CT scan: corresponding zone on CT of the neck (lower inset).

of the parathyroid glands. Her current respiratory discomfort was considered to be related to a defect of glottal occlusion, which was more marked during phonatory efforts. This defect was demonstrated on computer-assisted voice analysis.

A neck incision was performed to complete the left thyroid lobectomy. A nodule was detected within the poorly delimited remaining left thyroid lobe and frozen section examination revealed a benign follicular nodule not comprising any parathyroid tissue. No other nodules, especially parathyroid nodules, were observed. No further surgery was performed while waiting for the results of the definitive histological examination. However, the laboratory work-up on postoperative day 1 revealed normal serum ionized calcium at 1.18 mmol/L and 1-84 PTH level had decreased to 30 pg/mL.

The postoperative course was uneventful. Definitive histology of the left thyroid lobectomy specimen confirmed the presence of a nodule within the residual thyroid tissue, composed of benign follicular thyroid tissue, associated with a predominantly oncocytic, intracapsular, intra-thyroid parathyroid adenoma, with no suspicious signs. This mass, therefore, corresponded to the palpable nodule, detected on ultrasound and presenting increased MIBI and Choline uptake.

These features corresponded to parathyroid adenoma within a previously operated left thyroid lobe. The presence of Hürtle cells on fine-needle aspiration cytology associated with hyperparathyroidism, while only one nodule was detected on ultrasound and scans, suggested the presence of an exclusively parathyroid disease.

It is difficult to distinguish Hürtle cell thyroid and parathyroid tumours on cytology, because of their cytomorphological similarities. Both tumours comprise epithelial cells with a micro-follicular pattern on a colloid or colloid-like background, and the presence of oxyphil cells and single cells, resembling Hürthle cell and lymphocytes, respectively [2,3] (Fig. 2 corresponding to the case reported here). In oncocytic parathyroid adenomas, the cells are very large and adherent to each other, nuclei are small and darker, nucleoli are barely visible, with numerous single cells and no colloid, but a similar substance. The monotonous cell population presents indistinct cytoplasmic borders forming large cohesive sheets with pseudopapillary patterns. In Hürthle cell thyroid tumours, the cells are less adherent, nuclei are larger and nucleoli are prominent; single cells are rare and colloid is present. Immuno-histochemistry also demonstrates TTF-1 (nuclear labelling) and thyroglobulin (colloid labelling) in thyroid tumours, while these antigens are absent in parathyroid tumours [3].

^{99m}Tc-sestamibi scan is the reference examination for the detection of hyper-functioning parathyroid glands. However, the incidental finding of a cold thyroid nodule is not unusual during the assessment of hyperparathyroidism [4]; it is suspicious of

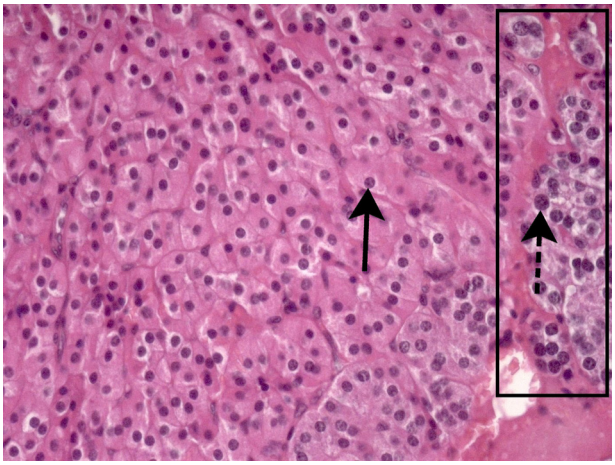

Fig. 2. Presence of cells presenting oncocytic metaplasia (arrow) and normal parathyroid cells (inset, broken arrow). Haematoxylin-Eosin-Saffron × 200.

malignancy when it takes up MIBI, and constitutes an indication for fine-needle aspiration cytology of the nodule. MIBI scan has a low sensitivity (35%) and specificity (4.1%) for these nodules [5]. FCH-PET scan using ^{18}F-fluorocholine as marker (currently used to detect bone metastases and prostate cancer recurrences) is a new tool for the assessment of hyperparathyroidism, which may be indicated in the presence of a discordance between ultrasound and MIBI scan [6]. However, it is not more reliable than MIBI scan to characterize a thyroid nodule.

3. Conclusion

Parathyroid glands are composed of chief cells and oncocytic cells. A single thyroid nodule, for which cytology reveals oncocytic cells, should raise the suspicion of an intra-thyroid parathyroid adenoma in the presence of hyperparathyroidism. Parathyroid scan shows increased uptake, but is unable to differentiate a suspicious thyroid nodule from an abnormal intra-thyroid parathyroid gland. Surgical exploration must look for an abnormal, sometimes intra-thyroid parathyroid gland.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

References

[1] Périé S, Garrel R. Rapport de la Société française d'ORL chirurgie de la glande thyroïde pathologie chirurgicale de la glande thyroïde. In: Situations cliniques et arbres décisionnels. Européenne d'Éditions; 2012. p. 313–22.
[2] Cibas ES, Ali SZ. The Bethesda system for reporting thyroid cytopathology. Thyroid 2009;19:1159–65.
[3] Paker I, Yilmazer D, Yandakci K, et al. Intrathyroidal oncocytic parathyroid adenoma: a diagnostic pitfall on fine-needle aspiration. Diagn Cytopathol 2010;38:833–6.
[4] Onkendi EO, et al. Thyroid cancer detection with dual-isotope parathyroid scintigraphy in primary hyperparathyroidism. Ann Surg Oncol 2012;19:1446–52.
[5] Boi F, et al. Thyroid diseases cause mismatch between MIBI scan and neck ultrasound in the diagnosis of hyperfunctioning parathyroids: usefulness of FNA-PTH assay. Eur J Endocrinol 2013;168:49–58.
[6] Michaud L, Burgess A, Huchet V, et al. Is 18F-fluorocholine-PET/CT a new imaging tool for detecting hyperfunctioning parathyroid glands in primary or secondary hyperparathyroidism? J Clin Endocrinol Metab 2014;99(12):4531–6.